F ractions and D ecim als

For questions in the Q uantitative C om parison form at (“Q uantity A ” and “Q uantity B ” given),the answ er choices are alw ays as follow s:

(A) Q uantity A is greater.
(B) Q uantity B is greater.
(C) The tw o quantities are equal.
(D) The relationship cannot be determ ined from the inform ation given.

For questions follow ed by a num eric entry box ,you are to enter your ow n answ er in the box.For questions follow ed by fraction-style num eric entry boxes ,you are to enter your answ er in the form of a fraction.Y ou are not required to reduce fractions.For exam ple,if the answ er is 1/4,you m ay enter 25/100 or any equivalent fraction.

A ll num bers used are real num bers.A ll figures are assum ed to lie in a plane unless otherw ise indicated.G eom etric figures are not necessarily draw n to scale.Y ou should assum e,how ever,that lines that appear to be straight are actually straight,points on a line are in the order show n,and all geom etric objects are in the relative positions show n.C oordinate system s,such as *xy*-planes and num ber lines,as w ell as graphical data presentations such as bar charts,circle graphs,and line graphs, *are* draw n to scale.A sym bol that appears m ore than once in a question has the sam e m eaning throughout the question.

1. $\frac{1}{2}+\frac{2}{3}+\frac{3}{4}+\frac{4}{5}+\frac{5}{6}=$

2.

Q uantity A	**Q uantity B**
$-\frac{3}{4}+\frac{2}{3}$	$-\frac{3}{4}\times\frac{2}{3}$

3.The tem perature in Lim erick is 3/4 that in C airo,w here the tem perature is 8/5 that in H alifax.If the tem perature in

Lim erick is 60°,w hat is the tem perature in H alifax?

(A) 50°
(B) 55°
(C) 64°
(D) 72°
(E) 75°

4.A t a convention of m onsters,2/5 have no horns,1/7 have one horn,1/3 have tw o horns,and the rem aining 26 have three or m ore horns.H ow m any m onsters are attending the convention?

(A) 100
(B) 130
(C) 180
(D) 210
(E) 260

5.O ne dose of secret form ula is m ade from 1/6 ounce of Substance X and 2/3 ounce of Substance Z .H ow m any doses are in a 30-ounce vial of secret form ula?

(A) 20
(B) 24
(C) 30
(D) 36
(E) 45

6.D evora spends 1/4 of her m oney on a textbook,and then buys a notebook that costs 1/6 the price of the textbook. A ssum ing she m akes no other purchases,w hat fraction of her m oney does D evora have left over?

$$\frac{\square}{\square}$$

7.0.003482 =

Indicate <u>all</u> such statem ents.

☐ -0.003482×10^{-1}
☐ 0.3482×10^{-2}
☐ 34.82×10^{4}
☐ 34.82×10^{-4}
☐ $3,482 \times 10^{-6}$

8.12.12×10^{-3} =

Indicate <u>all</u> such statem ents.

☐ -1.21×10^{3}

☐ 0.012

☐ 0.00001212×10^3

☐ 0.01212×10^3

9.5 is how m any fifths of 10?

(A) 2.5
(B) 5
(C) 10
(D) 20
(E) 50

10.

$x > 0$ and $y > 0$

Q uantity A	**Q uantity B**
$\frac{1}{x} + \frac{1}{y}$	$\frac{xy}{x+y}$

11.

Q uantity A	**Q uantity B**
$\frac{75}{4^2} \times \frac{3^2}{45} \times \frac{2^4}{45}$	$\frac{3^2}{4^2} \times \frac{2^2}{5^2} \times \frac{10}{3}$

12.5/12 of all the students are girls and 1/4 of all the students are girls w ho take Spanish.W hat fraction of the girls take Spanish?

(A) 5/48
(B) 5/12
(C) 2/5
(D) 3/5
(E) 7/12

13.1/5 of all the cars on a certain auto lot are red,and 2/3 of all the red cars are convertibles.W hat fraction of all the cars are N O T red convertibles?

$$\frac{\square}{\square}$$

14.Tw o identical pies are cut into a total of 16 equal parts.If each part is then split equally am ong three people,w hat fraction of a pie does each person receive?

(A) 1/48

(B) 1/24
(C) 1/16
(D) 3/16
(E) 3/8

15.W hich of the follow ing are bigger than tw ice 21/49?

Indicate all such values.

☐ 0.84
☐ 0.857
☐ 0.858
☐ 0.86

16.

$$xy \neq 0$$

Q uantity A	**Q uantity B**
$2+\frac{1}{xy}$	$\frac{2xy+1}{xy}$

17.

Q uantity A	**Q uantity B**
$\dfrac{\frac{1}{4}}{\frac{2}{3}-\dfrac{1-2}{\frac{1}{3}}}$	$\dfrac{\frac{1}{3}}{\frac{1}{4}-\dfrac{3-4}{\frac{2}{3}}}$

18.

A t Store A ,3/4 of the apples are red.
A t Store B ,w hich has tw ice as m any apples,0.375 of them are red.

Q uantity A	**Q uantity B**
The num ber of red apples at Store A	The num ber of red apples at Store B

19.

D w eezil has one third the num ber of black m arbles that G ina has,but he has tw ice as m any w hite m arbles.
B oth people have only black m arbles and w hite m arbles.

Q uantity A	**Q uantity B**

The num ber of m arbles D w eezil has The num ber of m arbles G ina has

20.A pot of soup is divided equally into tw o bow ls.If M anuel eats 1/4 of one of the bow ls of soup and 2/5 of the other bow l of soup,how m uch of the soup did M anuel eat?

$$\frac{\boxed{}}{\boxed{}}$$

21.W hat is half of $\frac{x^2}{8}$?

(A) $\frac{x}{4}$

(B) $\frac{x^2}{4}$

(C) $\frac{x}{8}$

(D) $\frac{x^2}{16}$

(E) It cannot be determ ined.

22. $\dfrac{\frac{ab}{c}}{\frac{cd}{a}} =$

(A) *ac*

(B) *bd*

(C) $\frac{1}{bd}$

(D) $\frac{a^2b}{c^2d}$

(E) $\frac{ab^2}{cd^2}$

23. $\left(\frac{\sqrt{12}}{5}\right)\left(\frac{\sqrt{60}}{2^4}\right)\left(\frac{\sqrt{45}}{3^2}\right) =$

(A) $\frac{1}{12}$

(B) $\frac{1}{6}$

(C) $\frac{1}{4}$

(D) $\frac{1}{3}$

(E) $\frac{1}{2}$

24. $\frac{-1}{2x}-\frac{1}{4y}+\frac{1}{xy}+\frac{1}{8}=$

(A) $\frac{(x-4)(2-y)}{8xy}$

(B) $\frac{(x-2)(y-4)}{8xy}$

(C) $\frac{(x-4)(y-2)}{8xy}$

(D) $\frac{(x+2)(4-y)}{8xy}$

(E) $\frac{(x-2)(4-y)}{8xy}$

25.

x is a digit in the decim al 12.15x9,w hich,if rounded to the nearest hundredth,w ould equal 12.16.

Q uantity A	**Q uantity B**
x	4

26. $\frac{\frac{a}{b}}{\frac{c}{d}+\frac{e}{f}}=$

(A) $\frac{acd}{bcf+def}$

(B) $\frac{ace}{bdf+bcd}$

(C) $\frac{acf}{bde+cdf}$

(D) $\frac{ade}{bef+cdf}$

(E) $\frac{adf}{bcf+bde}$

27. $\frac{(17^2)(22)(38)(41)(91)}{(19)(34)(123)(11)(119)(26)} =$

$$\frac{\boxed{}}{\boxed{}}$$

28. In a decim al num ber, a bar over one or m ore consecutive digits m eans that the pattern of digits under the bar repeats w ithout end. A s a fraction, $7.58\overline{3} =$

$$\frac{\boxed{}}{\boxed{}}$$

29.

<u>**Q uantity A**</u>	<u>**Q uantity B**</u>
$\left(\frac{\sqrt{25}}{\sqrt{10}}\right)\left(\frac{\sqrt{8}}{\sqrt{15}}\right)$	$\left(\frac{\sqrt{51}}{\sqrt{46}}\right)\left(\frac{\sqrt{23}}{\sqrt{34}}\right)$

$$\sqrt{\frac{3}{2}}-\sqrt{\frac{2}{3}}=$$

(A) $\frac{\sqrt{3}-\sqrt{2}}{\sqrt{6}}$

(B) $\frac{1}{\sqrt{6}}$

(C) $\frac{\sqrt{3}}{3}$

(D) $\frac{\sqrt{3}}{2}$

(E) $\frac{\sqrt{5}}{\sqrt{6}}$

31.If $abc \neq 0$,then $\frac{ab}{cb}+\frac{a}{c}-\frac{a^2b^3}{abc}=$

(A) $\frac{a-b^2}{c}$

(B) $\frac{a^2-2b^2}{c}$

(C) $\frac{2a^2-b^2}{c}$

(D) $\frac{a(2-b^2)}{c}$

(E) $\frac{a^2b(2-b^2)}{c}$

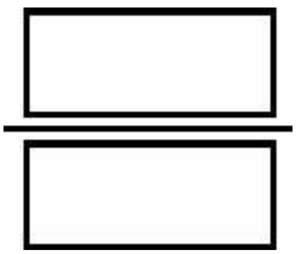
32.If 3/4 of all the cookies have nuts and 1/3 of all the cookies have both nuts and fruit,w hat fraction of all the cookies have nuts but no fruit?

(A) 1/4
(B) 5/12
(C) 1/2
(D) 7/12
(E) 5/6

33.1/4 of all the juniors and 2/3 of all the seniors are going on a trip.If there are 2/3 as m any juniors as seniors,w hat fraction of the students are not going on the trip?

(A) 4/9
(B) 1/2
(C) 2/3
(D) 1/3
(E) 5/6

34.4/5 of the w om en and 3/4 of the m en speak Spanish.If there are 40% as m any m en as w om en,w hat fraction of the group speaks Spanish?



35.

$$abcd \neq 0$$

Q uantity A	**Q uantity B**
$\frac{a^2b}{cd^2} \times \frac{d^3}{abc}$	$\frac{d^2}{bc} \times \frac{ab^2}{bd}$

36.

Q uantity A	**Q uantity B**
$\frac{24}{3\sqrt{2}} - \frac{4}{\sqrt{2}}$	$\sqrt{6}$

37.

$$m \neq 0$$

Q uantity A	**Q uantity B**
$\left(\frac{1}{2} + \frac{1}{m}\right)(m+2)$	$\frac{(m+2)^2}{2m}$

38.

The reciprocal of x's non-integer decim al part equals $x + 1$,and $x > 0$.

Q uantity A	**Q uantity B**
x	$\sqrt{2}$

39.W hich tw o of the follow ing num bers have a sum betw een 1 and 2?

Indicate <u>both</u> of the num bers.

☐ $\frac{7(2^3)}{3^3-7}$

☐ $\frac{2^4}{1+2+3+4}$

☐ $\frac{3}{11} \div \frac{6}{11}$

☐ $\frac{-2^3 3^2}{2^2 5^2}$

☐ $\frac{-11^2-11^3}{(30)(44)}$

40.W hich three of the follow ing answ ers,w hen m ultiplied by each other,yield a product less than -1?

Indicate <u>all three</u> num bers.

☐ $\frac{-15}{17}$

☐ $\frac{-18}{19}$

☐ $\frac{23}{-22}$

☐ $\frac{17}{-16}$

41.The decim al representation of the reciprocal of integer *n* contains an infinitely repeating pattern of digits, expressed w ith a bar over the repeating digits.The m inim um length of the bar (in digits) is *n* - 1.

Indicate <u>all</u> of the integers below that could be *n*.

☐ 3
☐ 5
☐ 7
☐ 9
☐ 11

42. $(3-\frac{1}{3})^2+(3+\frac{1}{3})^2=$

(A) 122/9
(B) 164/9
(C) 36
(D) 164/3
(E) 162

43.If $\frac{3}{\frac{m+1}{m}+1}=1$,then m m ust equal

(A) -2
(B) -1
(C) 0
(D) 1
(E) 2

44.

$$rs=\sqrt{3}$$

Q uantity A	**Q uantity B**
$\frac{2r\sqrt{12}}{r^2s\sqrt{72}}$	$\frac{14rs^2}{42s}$

45.

Q uantity A	**Q uantity B**
$\frac{\sqrt{10}}{\sqrt{8}}\div\frac{\sqrt{9}}{\sqrt{10}}$	$\frac{\sqrt{11}}{\sqrt{9}}\div\frac{\sqrt{10}}{\sqrt{11}}$

46.

$$\frac{x}{m}>0$$

Q uantity A	**Q uantity B**
$\frac{11m+17x}{11m}$	$\frac{17m+11x}{17m}$

47.W hich of the follow ing fractions has the greatest value?

(A) $\dfrac{7}{(16^2)(25)}$

(B) $\dfrac{5}{(32)(5^4)}$

(C) $\dfrac{30}{(512)(5^3)}$

(D) $\dfrac{5}{(4^6)(5)}$

(E) $\dfrac{4}{(2^{11})(5^2)}$

48.

$$\frac{m}{p} > \frac{n}{p}$$

<u>**Q uantity A**</u>	<u>**Q uantity B**</u>
m	n

49.If $2x \neq y$ and $5x \neq 4y$,then

$$\frac{\dfrac{5x-4y}{2x-y}}{\dfrac{3y}{y-2x}+5} =$$

(A) $\dfrac{1}{2}$

(B) $\dfrac{3}{2}$

(C) $\dfrac{5}{2}$

(D) $\dfrac{7}{2}$

(E) $\dfrac{9}{2}$

50. $\frac{39^2}{2^4} \div \frac{13^3}{4^2} =$

(A) $\frac{13}{2}$

(B) $\frac{9}{2}$

(C) $\frac{3}{2}$

(D) $\frac{3}{13}$

(E) $\frac{9}{13}$

51.To the nearest integer,the non-negative fourth root of integer *n* rounds to 3.Inclusive,*n* is betw een

(A) 0 and 1
(B) 2 and 3
(C) 4 and 9
(D) 10 and 39
(E) 40 and 150

Fractions and Decimals Answers

1. $\frac{71}{20}$ **(or any equivalent fraction).** Add all the fractions by finding a common denominator, which is a multiple of 2, 3, 4, 5, and 6. The smallest number that will work is 60.

$$\frac{1}{2}+\frac{2}{3}+\frac{3}{4}+\frac{4}{5}+\frac{5}{6}=\frac{30}{60}+\frac{40}{60}+\frac{45}{60}+\frac{48}{60}+\frac{50}{60}=\frac{30+40+45+48+50}{60}=\frac{213}{60}=\frac{71}{20}$$

2. **(A).** In Quantity A, get a common denominator and then add:

$$-\frac{3}{4}+\frac{2}{3}=-\frac{9}{12}+\frac{8}{12}=-\frac{1}{12}$$

In Quantity B, multiply across (common denominators are only needed for addition and subtraction). You can cancel the 3's first if you wish:

$$-\frac{3}{4}\times\frac{2}{3}=-\frac{\cancel{3}}{4}\times\frac{2}{\cancel{3}}=-\frac{2}{4}=-\frac{1}{2}$$

$-\frac{1}{12}$ is larger than $-\frac{1}{2}$. (Be careful with negatives! The closer to 0 a negative is, the larger it is.)

3. **(A).** When you are given two relationships in one sentence, follow the grammar carefully to make sure you produce the right equations. The first sentence of the problem gives you two relationships:

> The temperature in Limerick is 3/4 that in Cairo.
> The temperature in Cairo is 8/5 that in Halifax.

$$L=\frac{3}{4}C$$
$$C=\frac{8}{5}H$$

Replace *C* with (8/5)*H* in the first equation:

$$L=\frac{3}{4}\left(\frac{8}{5}H\right)$$

$$L=\frac{24}{20}H$$

$$L=\frac{6}{5}H$$

N ow plug in 60 for *L*:

$$60=\frac{6}{5}H$$

$$\frac{5}{6}\times 60=H$$

$$50=H$$

4.**(D).**This is a com m on G R E setup— you have been given several fractions and one actual num ber.O nce you know w hat fraction of the w hole that num ber represents,you can solve for the total (call the total *m*).N otice that all of the denom inators are prim es,so they don't share any factors.Therefore you w ill have to m ultiply them all together to find a com m on denom inator.5 × 7 × 3 = 105:

$$\frac{2}{5}+\frac{1}{7}+\frac{1}{3}=\frac{42}{105}+\frac{15}{105}+\frac{35}{105}=\frac{92}{105}$$

That m eans that the rem aining 26 m onsters represent 13/105 of the total m onsters at the convention:

$$26=\frac{13}{105}m$$

$$\frac{105}{13}\times 26=m$$

$$105\times 2=m$$

$$210=m$$

5.**(D).**To find the num ber of doses in the vial,you need to divide the total volum e of the form ula in the vial by the volum e of one dose.

O ne dose = 1/6 + 2/3 = 1/6 + 4/6 = 5/6

N ow divide 30 ounces by 5/6:

30 ÷ 5/6 = 30 × 6/5 = 36

6. $\frac{17}{24}$ **(or any equivalent fraction).** The textbook costs 1/4 of Devora's money. The notebook costs 1/6 *of that amount*, or $\frac{1}{6}\left(\frac{1}{4}\right)=\frac{1}{24}$ of Devora's money. Thus, Devora has spent $\frac{1}{4}+\frac{1}{24}=\frac{6}{24}+\frac{1}{24}=\frac{7}{24}$ of her money. Subtract from 1 to get the fraction she has left: $1-\frac{7}{24}=\frac{24}{24}-\frac{7}{24}=\frac{17}{24}$.

Alternatively, pick a value for Devora's money. (Look at the denominators in the problem — 4 and 6— and pick a value that both numbers go into.) For instance, say Devora has $120. She would spend 1/4, or $30 on the textbook. She would spend 1/6 *of that* amount, or $5, on the notebook. She would have spent $35 and have $85 left, and thus $\frac{85}{120}$ of her money left. Reduce $\frac{85}{120}$ to get $\frac{17}{24}$, or simply enter $\frac{85}{120}$ in the boxes. This will work with any value you pick for Devora's total.

7. **II, IV, and V only.** Note that the first answer is negative, so it cannot be correct. For the second answer, move the decimal 2 places to the left: $0.3482 \times 10^{-2} = 0.003482$ (correct). For the third answer, move the decimal 4 places to the *right* (since the exponent is positive)— this move makes the number much larger and cannot be correct. For the fourth answer, move the decimal 4 places to the left: $34.82 \times 10^{-4} = 0.003482$ (correct). For the fifth answer, move the decimal 6 places to the left: $3{,}482 \times 10^{-6} = 0.003482$ (correct).

8. **III only.** First, simplify $12.12 \times 10^{-3} = 0.01212$. Now, test which answers are equal to this value. The first answer is negative, so it cannot be correct. The second answer is simply 0.012 and is therefore incorrect (the end has been "chopped off," so the number is not the same value). The third answer is $0.00001212 \times 10^{3} = 0.01212$ and is correct. The fourth answer is $0.01212 \times 10^{3} = 12.12$ and is not correct.

9. **(A).** Translate the words into math. If *x* means "how many," then "how many fifths" is $\frac{x}{5}$:

$$5=\frac{x}{5}\times 10$$

$$5=\frac{10x}{5}$$

$$25=10x$$

$$\frac{25}{10}=x$$

$$x=2.5$$

10. **(D).** Add the fractions in Quantity A by making a common denominator (xy):

$$\frac{1}{x}+\frac{1}{y}=\frac{y}{xy}+\frac{x}{xy}=\frac{y+x}{xy}$$

Quantity B is just the reciprocal of Quantity A — one fraction is the “flipped” version of the other.You also know that both quantities are positive.However,without knowing more about *x* and *y*,you don’t know whether Quantity A or Quantity B is bigger.

11.**(A).**Simplify each quantity by breaking down to primes and canceling factors:

Quantity A : $$\frac{75}{4^2}\times\frac{3^2}{45}\times\frac{2^4}{45}=\frac{3\times5\times5}{\left(2^2\right)^2}\times\frac{3^2}{3\times3\times5}\times\frac{2^4}{3\times3\times5}=\frac{2^4\times3^3\times5^2}{2^4\times3^4\times5^2}=\frac{1}{3}$$

Quantity B : $$\frac{3^2}{4^2}\times\frac{2^2}{5^2}\times\frac{10}{3}=\frac{3^2}{\left(2^2\right)^2}\times\frac{2^2}{5^2}\times\frac{2\times5}{3}=\frac{2^3\times3^2\times5}{2^4\times3\times5^2}=\frac{3}{2\times5}=\frac{3}{10}$$

Since $\frac{1}{3}>\frac{3}{10}$,Quantity A is bigger than Quantity B .You can compare these fractions by making a common denominator,by cross multiplying,or by comparing the decimal equivalents 0.333… and 0.3.

If you notice the same factors on each side in the same position (e.g.,3^2 on top or 4^2 on bottom),then you can save time by canceling those factors simultaneously from both quantities.

12.**(D).**The wording here is very confusing.The problem is *not* asking you to take 1/4 of 5/12.Rather,1/4 and 5/12 are fractions of the same number (the number of students in the whole class).A good way to avoid this confusion is to plug in a number for the class.Pick 12,as you’re asked to take 5/12ths of the class:

Class = 12
Girls = 5
Girls who take Spanish = 3 (1/4 of all the students)

You are asked for the number of girls who take Spanish over the number of girls.Thus,the answer is 3/5.

13.**13/15 (or any equivalent fraction).**If 1/5 of all the cars are red and 2/3 of THOSE are convertibles,then the fraction of all the cars that are red convertibles = (1/5)(2/3) = 2/15.Since you want all of the cars that are NOT red convertibles,subtract 2/15 from 1 to get 13/15.

14.**(B).**If *two* pies are cut into 16 parts,*each* pie is cut into eighths.Thus,1/8 of a pie is *divided* among three people. “One third of one eighth” = (1/3)(1/8) = 1/24.

15.**III and IV only.**Simply plug 21/49 into the calculator,and then multiply by 2 to get 0.857142… You need all values larger than this number.Obviously,0.84 is smaller.The next choice,0.857,might seem attractive;however,it is smaller than 0.857142… You can easily see this by adding zeroes to the end of 0.857 in order to more easily compare:

C hoice II: 0.857000
Y our num ber: 0.857142…

The third and fourth choices are,of course,larger than 0.857142…

16.**(C).**Transform Q uantity B by splitting the num erator:

$$\frac{2xy+1}{xy}=\frac{2xy}{xy}+\frac{1}{xy}$$

Then cancel the com m on factor *xy* from top and bottom of the first fraction:

$\frac{2xy}{xy}+\frac{1}{xy}=2+\frac{1}{xy}$,w hich is the sam e as Q uantity A .

A lternatively,you can transform Q uantity A by turning 2 into a fraction w ith the sam e denom inator (*xy*) as the second term .

$2+\frac{1}{xy}=\frac{2xy}{xy}+\frac{1}{xy}=\frac{2xy+1}{xy}$,w hich is the sam e as Q uantity B .

17.**(B).**Sim plify each quantity from the inside out.

Q uantity A : $$\frac{\frac{1}{4}}{\frac{2}{3}-\frac{1-2}{\frac{1}{3}}}=\frac{\frac{1}{4}}{\frac{2}{3}-\frac{-1}{\frac{1}{3}}}=\frac{\frac{1}{4}}{\frac{2}{3}-(-3)}=\frac{\frac{1}{4}}{\frac{2}{3}+3}=\frac{\frac{1}{4}}{\frac{2}{3}+\frac{9}{3}}=\frac{\frac{1}{4}}{\frac{11}{3}}=\frac{1}{4}\times\frac{3}{11}=\frac{3}{44}$$

Q uantity B : $$\frac{\frac{1}{3}}{\frac{1}{4}-\frac{3-4}{\frac{2}{3}}}=\frac{\frac{1}{3}}{\frac{1}{4}-\frac{-1}{\frac{2}{3}}}=\frac{\frac{1}{3}}{\frac{1}{4}-\left(\frac{-3}{2}\right)}=\frac{\frac{1}{3}}{\frac{1}{4}+\frac{3}{2}}=\frac{\frac{1}{3}}{\frac{1}{4}+\frac{6}{4}}=\frac{\frac{1}{3}}{\frac{7}{4}}=\frac{1}{3}\times\frac{4}{7}=\frac{4}{21}$$

Since Q uantity B has a larger num erator *and* a sm aller denom inator,it is larger than Q uantity A .This rule w orks for any positive fractions.O f course,you can also use the calculator to com pute the decim al equivalents.

18.**(C).**W hether you choose fractions or decim als,you w ant to m ake 3/4 and 0.375 the sam e form .Either w ay,you w ill see that 3/4 is double 0.375 (w hich is 3/8).Since Store B has tw ice as m any apples,3/8 of Store B 's apples is the sam e value as 3/4 of Store A 's apples.

A lternatively,pick num bers such that Store B has tw ice as m any apples.If Store A has 4 apples and Store B has 8 apples,then Store A w ould have (3/4)(4) = 3 red apples and Store B w ould have (0.375)(8) = 3 red apples.The values w ill alw ays be the sam e.

19.**(D).**To dem onstrate that there is not enough inform ation to determ ine w ho has m ore m arbles,try extrem e exam ples.D w eezil has 1/3 as m any black m arbles as G ina,but tw ice as m any w hite m arbles:

EX A M PLE 1: LO TS O F B LA C K M A R B LES

D w eezil:	1,000 black m arbles	2 w hite m arbles
G ina:	3,000 black m arbles	1 w hite m arble

In this exam ple,G ina has m ore.

EX A M PLE 2: LO TS O F W H ITE M A R B LES

D w eezil:	1 black m arble	2,000 w hite m arbles
G ina:	3 black m arbles	1,000 w hite m arbles

In this exam ple,D w eezil has m ore.

A s alw ays,w hen trying exam ples in Q uantitative C om parison problem s,you *m ust* try m ore than one exam ple— w ith the goal of proving (D).

20.**13/40 (or any equivalent fraction).**M anuel eats 1/4 of one-half of all the soup,and then 2/5 of the other half of all the soup.A s m ath:

$$\frac{1}{4}\left(\frac{1}{2}\right)+\frac{2}{5}\left(\frac{1}{2}\right)=\frac{1}{8}+\frac{1}{5}=\frac{13}{40}$$

A lternatively,pick num bers.Since you'll be dividing this num ber several tim es,pick a large num ber w ith m any factors For exam ple,say there are 120 ounces of soup.Each bow l w ould then have 60 ounces.M anuel w ould then eat 1/4 of one bow l (15 ounces) and 2/5 of the other bow l (24 ounces).In total,he w ould eat 39 ounces out of 120.W hile 39/120 w ould be counted as correct,it is also possible to reduce 39/120 (divide both num erator and denom inator by 3) to get 13/40,the answ er you reached via the other m ethod above.

21.**(D).**To take half of a num ber,m ultiply by $\frac{1}{2}$:

$$\frac{1}{2}\times\frac{x^2}{8}=\frac{x^2}{16}$$

22.**(D).**To divide by a fraction,m ultiply by its reciprocal:

$$\frac{\frac{ab}{c}}{\frac{cd}{a}} = \frac{ab}{c} \times \frac{a}{cd} = \frac{a^2 b}{c^2 d}$$

23.**(C).**Pull squares out of the square roots and cancel com m on factors:

$$\left(\frac{\sqrt{12}}{5}\right)\left(\frac{\sqrt{60}}{2^4}\right)\left(\frac{\sqrt{45}}{3^2}\right) = \frac{2\sqrt{3}}{5} \times \frac{2\sqrt{15}}{2^4} \times \frac{3\sqrt{5}}{3^2} = \frac{\sqrt{3}}{5} \times \frac{\sqrt{15}}{2^2} \times \frac{\sqrt{5}}{3}$$

Since $\sqrt{15} = \sqrt{3}\sqrt{5}$,you get

$$\frac{\sqrt{3}}{5} \times \frac{\sqrt{15}}{2^2} \times \frac{\sqrt{5}}{3} = \frac{\sqrt{3}}{5} \times \frac{\sqrt{3}\sqrt{5}}{2^2} \times \frac{\sqrt{5}}{3} = \frac{3 \times 5}{5 \times 2^2 \times 3} = \frac{1}{2^2} = \frac{1}{4}$$

24.**(C).**C om bine the four fractions by finding a com m on denom inator (8*xy*,w hich is also suggested by the answ er choices):

$$\frac{-1}{2x} - \frac{1}{4y} + \frac{1}{xy} + \frac{1}{8} = \frac{-1(4y)}{2x(4y)} - \frac{1(2x)}{4y(2x)} + \frac{1(8)}{xy(8)} + \frac{1(xy)}{8(xy)}$$
$$= \frac{-4y}{8xy} - \frac{2x}{8xy} + \frac{8}{8xy} + \frac{xy}{8xy} = \frac{xy - 4y - 2x + 8}{8xy}$$

N ow the key is to factor the top expression correctly.

$xy-4y-2x + 8 = (x - 4)(y - 2)$

Y ou can alw ays FO IL the expression on the right to m ake sure it m atches the left-hand side.

So,in the end you have $\frac{xy - 4y - 2x + 8}{8xy} = \frac{(x-4)(y-2)}{8xy}$.

25.**(A).**Since the decim al rounds to 12.16,the thousandths digit *x* m ust be 5 or greater (6,7,8,or 9).A ll of these possibilities are greater than 4.

26.**(E).**Sim plify from the inside out by finding a com m on denom inator (*df*) for the tw o fractions “inside”:

$$\frac{\frac{a}{b}}{\frac{c}{d}+\frac{e}{f}}=\frac{\frac{a}{b}}{\frac{cf}{df}+\frac{de}{df}}$$

N ext,add those tw o inside fractions;then flip and m ultiply:

$$\frac{\frac{a}{b}}{\frac{cf}{df}+\frac{de}{df}}=\frac{\frac{a}{b}}{\frac{cf+de}{df}}=\frac{a}{b}\times\frac{df}{cf+de}=\frac{adf}{bcf+bde}$$

27. $\frac{1}{3}$ **(or any equivalent fraction).** Y ou could just punch the w hole num erator and the w hole denom inator into the calculator and subm it each product.If you’re very careful,that w ill w ork.H ow ever,it m ight be w ise to try canceling som e com m on factors out of the fraction,to save tim e and to avoid errors.It’s fine to sw itch to the calculator w henever the cancellations aren’t obvious.

$$\frac{(17^2)\cancel{(22)}(38)(41)(91)}{(19)(34)(123)\cancel{(11)}(119)(26)}=\frac{(17^2)(2)(\cancel{38}2)(41)(91)}{\cancel{(19)}(34)(123)(119)(26)}$$
$$=\frac{(17^{\cancel{2}})(2)(2)(41)(91)}{(\cancel{34}2)(123)(119)(26)}=\frac{(17)(2)(2)\cancel{(41)}(91)}{(2)(\cancel{123}3)(119)(26)}$$
$$=\frac{(17)(2)(2)(\cancel{91}7)}{(2)(3)(119)(\cancel{26}2)}=\frac{\cancel{(17)}(2)(2)\cancel{(7)}}{(2)(3)(\cancel{17}\times\cancel{7})(2)}$$
$$=\frac{\cancel{(2)}\cancel{(2)}}{\cancel{(2)}(3)\cancel{(2)}}=\frac{1}{3}$$

28. $\frac{91}{12}$ **(or any equivalent fraction).** First,turn the decim al into a sum of tw o pieces,to separate the repeating portion.

$$7.58\overline{3}=7.58+0.00\overline{3}$$

D eal w ith each piece in turn.Like any other term inating decim al,7.58 can be w ritten as a fraction w ith a pow er of 10 in the denom inator.

$$7.58=\frac{758}{100}$$

Now, when you look at the repeating portion, you should be reminded that $0.\overline{3} = 0.3333... = \frac{1}{3}$

So $0.00\overline{3}$ is just $\frac{1}{3}$, moved by a couple of decimal places. $0.00\overline{3} = (0.\overline{3})(0.01) = \left(\frac{1}{3}\right)\left(\frac{1}{100}\right) = \frac{1}{300}$

Finally, you can write the original decimal as a sum of fractions, and then combine those fractions.

$$7.58\overline{3} = 7.58 + 0.00\overline{3} = \frac{758}{100} + \frac{1}{300} = \frac{758 \times 3}{300} + \frac{1}{300} = \frac{2,275}{300}$$

You can enter $\frac{2,275}{300}$, unreduced, or you can reduce it to $\frac{91}{12}$ if you want.

29. **(A).** Simplify each quantity by factoring the square roots, then canceling.

Quantity A: $\left(\frac{\sqrt{25}}{\sqrt{10}}\right)\left(\frac{\sqrt{8}}{\sqrt{15}}\right) = \left(\frac{5}{\sqrt{2}\sqrt{5}}\right)\left(\frac{2\sqrt{2}}{\sqrt{3}\sqrt{5}}\right) = \left(\frac{\cancel{5}}{\sqrt{2}\cancel{\sqrt{5}}}\right)\left(\frac{2\sqrt{2}}{\sqrt{3}\cancel{\sqrt{5}}}\right) =$

$$\left(\frac{1}{\cancel{\sqrt{2}}}\right)\left(\frac{2\cancel{\sqrt{2}}}{\sqrt{3}}\right) = \frac{2}{\sqrt{3}}$$

Quantity B: $\left(\frac{\sqrt{51}}{\sqrt{46}}\right)\left(\frac{\sqrt{23}}{\sqrt{34}}\right) = \left(\frac{\sqrt{3}\cancel{\sqrt{17}}}{\sqrt{2}\sqrt{23}}\right)\left(\frac{\sqrt{23}}{\sqrt{2}\cancel{\sqrt{17}}}\right) = \left(\frac{\sqrt{3}}{\sqrt{2}\cancel{\sqrt{23}}}\right)\left(\frac{\cancel{\sqrt{23}}}{\sqrt{2}}\right) = \frac{\sqrt{3}}{2}$

Since $\sqrt{3} < 2$, Quantity B is smaller than 1, whereas Quantity A is greater than 1.

Of course, you can use the calculator here, but the process would be slower and more prone to error.

30. **(B).** The square root of a fraction is the square root of the top over the square root of the bottom.

$$\sqrt{\frac{3}{2}} - \sqrt{\frac{2}{3}} = \frac{\sqrt{3}}{\sqrt{2}} - \frac{\sqrt{2}}{\sqrt{3}}$$

Then make a common denominator: $\sqrt{3}\sqrt{2} = \sqrt{6}$.

$$\frac{\sqrt{3}}{\sqrt{2}} - \frac{\sqrt{2}}{\sqrt{3}} = \frac{\sqrt{3}\sqrt{3}}{\sqrt{3}\sqrt{2}} - \frac{\sqrt{2}\sqrt{2}}{\sqrt{3}\sqrt{2}} = \frac{3}{\sqrt{6}} - \frac{2}{\sqrt{6}} = \frac{1}{\sqrt{6}}$$

31.**(D).**Sim plify each fraction first by canceling com m on term s from top and bottom .

$$\frac{ab}{cb}+\frac{a}{c}-\frac{a^2b^3}{abc}=\frac{a\cancel{b}}{c\cancel{b}}+\frac{a}{c}-\frac{a^{\cancel{2}}b^{\cancel{3}2}}{\cancel{a}\cancel{b}c}=\frac{a}{c}+\frac{a}{c}-\frac{ab^2}{c}$$

Luckily,every fraction now has the sam e denom inator,so you can just add/subtract the num erators.

$$\frac{a}{c}+\frac{a}{c}-\frac{ab^2}{c}=\frac{2a-ab^2}{c}=\frac{a\left(2-b^2\right)}{c}$$

32.**(B).**Since 3/4 of the cookies have nuts and 1/3 of the cookies *also* have fruit,sim ply subtract 3/4 - 1/3 to get all the cookies w ith nuts but no fruit.

$$\frac{3}{4}-\frac{1}{3}=\frac{9}{12}-\frac{4}{12}=\frac{5}{12}$$

A lternatively,pick num bers.Since you w ill be dividing by 4 and 3,pick a num ber divisible by 4 and 3.If there are 12 cookies,then 9 have nuts and 4 have nuts and fruit,so 5— and thus 5/12 of the total— w ould have nuts but no fruit.

33.**(B).**If you have to take fractions of different num bers that are *also* related by a fraction,then you should try plugging num bers.Since there are 2/3 as m any juniors as seniors,som e easy num bers are:

Juniors = 20

Seniors = 30

Juniors going on trip = $\frac{1}{4}$ (20) = 5

Seniors going on trip = $\frac{2}{3}$ (30) = 20

O ut of 50 total students,25 are going on the trip,so 25 are N O T going on the trip.The answ er is 25/50 = 1/2.

34.**11/14 (or any equivalent fraction).**If you have to take fractions of different num bers that are *also* related by a fraction or percent,then you should try plugging num bers.Since there are 40% as m any m en as w om en,som e easy num bers are:

M en: 40

Wom en: 100

Wom en w ho speak Spanish = $\frac{4}{5}$ (100) =

80 M en w ho speak Spanish = $\frac{3}{4}$ (40) = 30

The group has 140 total people and 110 Spanish speakers.110/140 = 11/14 (you are not required to reduce,as long as your answ er is correct and fits in the box).

35.**(D).**C ancel factors on top and bottom of each product.

Quantity A : $\frac{a^2b}{cd^2} \times \frac{d^3}{abc} = \frac{a^2bd^3}{abc^2d^2} = \frac{ad}{c^2}$

Quantity B : $\frac{d^2}{bc} \times \frac{ab^2}{bd} = \frac{ab^2d^2}{b^2cd} = \frac{ad}{c}$

The tw o quantities differ in the denom inators: A has c^2,w hile B has *c*.So you can't tell w hich quantity is bigger, because som etim es c^2 is greater than *c*,and other tim es c^2 is less than *c*.

36.**(A).**Sim plify Q uantity A by canceling the com m on factor of 3 from top and bottom of the first fraction,then subtracting the num erators.

$$\frac{24}{3\sqrt{2}} - \frac{4}{\sqrt{2}} = \frac{8}{\sqrt{2}} - \frac{4}{\sqrt{2}} = \frac{8-4}{\sqrt{2}} = \frac{4}{\sqrt{2}}$$

N ow com pare Q uantity A $\left(\frac{4}{\sqrt{2}}\right)$ w ith Q uantity B $(\sqrt{6})$.M ultiply both quantities by $\sqrt{2}$ to elim inate the denom inator on the left.

$$\text{Quantity A} = \frac{4}{\sqrt{2}}\sqrt{2} = 4\text{, while Quantity B} = \sqrt{6}\sqrt{2} = \sqrt{12}\,.$$

Finally,square both quantities to get rid of the square-root sign:

Q uantity A = 4^2 = 16,w hile Q uantity B = $\left(\sqrt{12}\right)^2$ = 12.

Q uantity A is obviously larger.

37.**(D).**M ultiply out Q uantity A by FO ILing:

$$\left(\frac{1}{2} + \frac{1}{m}\right)(m+2) = \frac{1}{2}(m) + \frac{1}{2}(2) + \frac{1}{m}(m) + \frac{1}{m}(2)$$
$$= \frac{m}{2} + 1 + 1 + \frac{2}{m} = \frac{m}{2} + 2 + \frac{2}{m}$$

M ake a com m on denom inator (2*m*) to add these term s:

$$\frac{m}{2}+2+\frac{2}{m}=\frac{m(m)}{2(m)}+2\left(\frac{2m}{2m}\right)+\frac{(2)2}{(2)m}=\frac{m^2+4m+4}{2m}$$

Finally,look at Q uantity B .Since $(m + 2)^2 = m^2 + 4m + 4$,you know that the quantities are the sam e.

38.**(C).**Y ou can approach this problem by testing Q uantity B ($\sqrt{2}$) as x.U sing the calculator,you get $\sqrt{2}$… This decim al num ber doesn’t repeat,but isolate the non-integer decim al part.

$$\sqrt{2}-1\approx 0.41421356...$$

N ow take the reciprocal of both sides.

$$\frac{1}{\sqrt{2}-1}\approx\frac{1}{0.41421356...}=2.41421356...$$

The result seem s to be 1 m ore than the original num ber, $\sqrt{2}$.To prove this outcom e exactly,change the right side of the equation to $\sqrt{2}+1$ and rearrange.If the equation is true,you should be able to prove that the tw o sides are equal.

$$\frac{1}{\sqrt{2}-1}=\sqrt{2}+1?$$

C ross m ultiply.N otice the difference of squares:

$$1=\left(\sqrt{2}-1\right)\left(\sqrt{2}+1\right)?$$
$$1=\left(\sqrt{2}\right)^2-1^2=2-1=1$$

Since 1 = 1,the original equation is true,and $x=\sqrt{2}$.

39.**I and V only.**C om pute each value.For the sim ple cases,practice not using the calculator:

☐ $\frac{7(2^3)}{3^3-7}=\frac{7\times 8}{27-7}=\frac{56}{20}=2.8$

☐ $\frac{2^4}{1+2+3+4}=\frac{16}{10}=1.6$

☐ $\frac{3}{11}\div\frac{6}{11}=\frac{3}{11}\times\frac{11}{6}=\frac{3}{6}=\frac{1}{2}=0.5$

☐ $\frac{-2^3 3^2}{2^2 5^2}=\frac{-8\times 9}{10^2}=\frac{-72}{100}=-0.72$

☐ $\frac{-11^2-11^3}{(30)(44)}=\frac{-11^2(1+11)}{(30)(44)}=\frac{-121(12)}{(30)(44)}=\frac{-1,452}{-1,320}=-1.1$

In the last case,you could cancel factors and solve w ithout the calculator,or you could punch in the products on top and bottom as show n,then divide on the calculator.

Y ou've converted each value to decim al form ,to m ake them easy to add.Y ou are looking for tw o values that add up to a num ber betw een 1 and 2.Y ou know that there can only be tw o such values.

B y inspecting the positive num bers,you can see that no tw o of them add up to a num ber betw een 1 and 2.So you need a positive and a negative.The only tw o possibilities that w ork are 2.8 and -1.1.

40.**II,III,and IV only.**Y ou w ant the product of three of the num bers to be less than -1.Y ou can brute-force the calculation by trying all possible products,but you can use the relative size of the num bers to reduce the effort.

N otice that the four answ er choices are all very close to -1,but som e are greater than -1,and others are less than -1. To get the exact order,you can use the calculator,or you can think about the difference betw een each fraction and -1:

$\frac{-15}{17}=\frac{-17}{17}+\frac{2}{17}=-1+\frac{2}{17}$

$\frac{-18}{19}=\frac{-19}{19}+\frac{1}{19}=-1+\frac{1}{19}$,w hich is less than the previous num ber (since $\frac{2}{17}>\frac{1}{19}$)

$\frac{23}{-22}=\frac{-23}{22}=\frac{-22}{22}-\frac{1}{22}=-1-\frac{1}{22}$

$\frac{17}{-16}=\frac{-17}{16}=\frac{-16}{16}-\frac{1}{16}=-1-\frac{1}{16}$,a greater decrease from -1 than the previous num ber.

So the order of the original num bers relative to each other and to -1 is this: $\frac{17}{-16} < \frac{23}{-22} < -1 < \frac{-18}{19} < \frac{-15}{17}$

Try m ultiplying the three low est num bers first,since they w ill produce the low est product.O nly *one* product of the three num bers can be less than -1 (or there w ould be m ore than one right answ er),so the three num bers m ust be as follow s,as you can check on the calculator:

$$\frac{17}{-16} \times \frac{23}{-22} \times \frac{-18}{19} \approx -1.052... < -1$$

41.**III only.**First,elim inate any decim als that *don't* repeat.The reciprocal of 5,w hich is 15 $\frac{1}{5}$,equals 0.2,w hich doesn't repeat.N ext,use your calculator to com pute the repeating decim als that correspond to the other reciprocals.

$\frac{1}{3} = 0.333... = 0.\overline{3}$ The bar only has to be 1 digit long,w hich does not equal *n* - 1 (= 3 - 1 = 2).

$\frac{1}{7} = 0.14285714... = 0.\overline{142857}$ The bar is 6 digits long,w hich equals *n* - 1 (= 7 - 1 = 6).

$\frac{1}{9} = 0.111... = 0.\overline{1}$ The bar only has to be 1 digit long,w hich does not equal *n* - 1 (= 9 - 1 = 8).

$\frac{1}{11} = 0.0909... = 0.\overline{09}$ The bar only has to be 2 digits long,w hich does not equal *n* - 1 (= 11 - 1 = 10).

So,7 is the only possibility.

42.**(B).**First,sim plify inside the parentheses.Then,square and add:

$$\left(\frac{8}{3}\right)^2 + \left(\frac{10}{3}\right)^2$$

$$\frac{64}{9} + \frac{100}{9}$$

The answ er is 164/9.

43.**(D).**If the left-hand side of the equation is equal to 1,then the num erator and denom inator m ust be equal.Thus,the denom inator m ust also be equal to 3:

$$\frac{m+1}{m} + 1 = 3$$

$$\frac{m+1}{m} = 2$$

$$m + 1 = 2m$$

$$1 = m$$

A lternatively,you can just plug in each answ er choice (into both instances of *m* in the original equation),and stop w hen you hit a choice that w orks.

44.**(B).**C ancel com m on factors in each quantity and substitute in for *rs*.

Quantity A : $\frac{2r\sqrt{12}}{r^2s\sqrt{72}} = \frac{2\sqrt{12}}{rs\sqrt{72}} = \frac{2\sqrt{12}}{\sqrt{3}\sqrt{72}} = \frac{2\sqrt{4}}{\sqrt{72}} = \frac{2\times 2}{\sqrt{36}\sqrt{2}} = \frac{4}{6\sqrt{2}} = \frac{2}{3\sqrt{2}}$

Quantity B : $\frac{14rs^2}{42s} = \frac{14rs}{42} = \frac{14\sqrt{3}}{3\times 14} = \frac{\sqrt{3}}{3}$

A t this point,you can use the calculator,or you can com pare the tw o quantities w ith an “invisible inequality.”

$$\frac{2}{3\sqrt{2}} \quad ?? \quad \frac{\sqrt{3}}{3}$$

Since everything is positive,you can cross m ultiply (be sure to do so *upw ard*):

$$2 \times 3 \ ?? \ 3\times\sqrt{2}\sqrt{3}$$

N ow square both sides.Since everything is positive,the invisible inequality is unaffected:

$(2 \times 3)^2$?? $3^2 \times 2$
$\times 3$ 36 ?? 54

Since 36 < 54,Q uantity B is bigger.

45.**(A).**To divide fractions,m ultiply by the reciprocal.

Q uantity A : $\frac{\sqrt{10}}{\sqrt{8}} \div \frac{\sqrt{9}}{\sqrt{10}} = \frac{\sqrt{10}}{\sqrt{8}} \times \frac{\sqrt{10}}{\sqrt{9}} = \frac{10}{\sqrt{72}} = \frac{10}{6\sqrt{2}} = \frac{5}{3\sqrt{2}}$

Quantity B : $\frac{\sqrt{11}}{\sqrt{9}} \div \frac{\sqrt{10}}{\sqrt{11}} = \frac{\sqrt{11}}{\sqrt{9}} \times \frac{\sqrt{11}}{\sqrt{10}} = \frac{11}{3\sqrt{10}}$

Square both quantities to get rid of the square roots.

Quantity A : $\left(\frac{5}{3\sqrt{2}}\right)^2 = \frac{5^2}{3^2 2} = \frac{25}{18}$

Quantity B : $\left(\frac{11}{3\sqrt{10}}\right)^2 = \frac{11^2}{3^2 10} = \frac{121}{90}$

A t this point,use the calculator.Q uantity A is approxim ately 1.389,w hereas Q uantity B is approxim ately 1.344.

46.**(A).**A lw ays start by considering the initial given(s).If $x/m > 0$,then you know the tw o variables have the sam e sign (and that neither of them are 0).Looking dow n at the colum ns,you'll notice that there are com m on term s in the num erators and denom inators of both fractions,so it w ill probably pay off to separate out the fractions:

Quantity A : $\frac{11m+17x}{11m} = \frac{11m}{11m} + \frac{17x}{11m} = 1 + \frac{17x}{11m}$

Quantity B : $\frac{17m+11x}{17m} = \frac{17m}{17m} + \frac{11x}{17m} = 1 + \frac{11x}{17m}$

N ow that you've rephrased your tw o quantities,put them in an "invisible inequality" and see w hat you can do (since you don't know w hich side is greater,use a ? instead of the < or > sym bols).

$$1 + \frac{17x}{11m} \; ? \; 1 + \frac{11x}{17m}$$

$$\frac{17x}{11m} \; ? \; \frac{11x}{17m}$$

N ow isolate *x/m* on both sides:

$$\frac{17}{11} \times \frac{x}{m} \; ? \; \frac{11}{17} \times \frac{x}{m}$$

N ow ,because you know that *x/m* is positive,you can sim ply divide both sides by it:

$$\frac{17}{11} \; ? \; \frac{11}{17}$$

Y ou're left w ith tw o fractions,one of w hich is greater than 1,and one of w hich is less than 1.The answ er is (A).

47.**(A).**To determ ine w hich fraction is largest,cancel com m on term s from all five fractions until the rem aining values are sm all enough for the calculator.N ote that every choice has at least one 5 on the bottom ,so cancel 5^1 from all of the denom inators.

N ote also that every fraction has a pow er of 2 on the bottom ,so convert 16^2,32,512,4^6,and 2^{11} to pow ers of 2. Since $16 = 2^4$,$32 = 2^5$,$512 = 2^9$,and $4^6 = (2^2)^6 = 2^{12}$,so you now have:

(A) $\frac{7}{(2^4)(5)}$

(B) $\frac{5}{(2^5)(5^3)}$

(D) $\frac{30}{(2^9)(5^2)}$

(C) $\frac{5}{(2^{12})}$

(E) $\frac{4}{(2^{11})(5)}$

Since every choice has at least 2^4 on the bottom ,cancel 2^4 from all 5 choices:

(A) $\frac{7}{5}$

(B) $\frac{5}{(2)(5^3)}$

(C) $\frac{30}{(2^5)(5^2)}$

(D) $\frac{5}{2^8}$

(E) $\frac{4}{(2^7)(5)}$

N ote that the num erators also have som e pow ers of 2 and 5 that w ill cancel out w ith the bottom s of each of the fractions.In choice (C),30 = (2)(3)(5):

(A) $\frac{7}{5}$

(B) $\frac{1}{(2)(5^2)}$

(C) $\frac{3}{(2^4)(5)}$

(D) $\frac{5}{2^8}$

(E) $\frac{1}{(2^5)(5)}$

These values are now sm all enough for the calculator.N ote that the G R E calculator does not have an exponent button — to get 2^8,you m ust m ultiply 2 by itself 8 tim es.This is w hy you should m em orize pow ers of 2 up to 2^{10},and pow ers of 3,4,and 5 up to about the 4th pow er.

(A) 1.4
(B) 0.02
(C) 0.0125
(D) 0.01953125
(E) 0.00625

The answ er is (A).

48.**(D).**W ithout know ing the signs of any of the variables,you cannot assum e that *m* is larger.W hile it certainly *could* be (for instance,*m* = 4,*n* = 2,and *p* = 1),if *p* is negative,the reverse w ill be true (for instance,*m* = 2,*n* = 4, and *p* = -1).

49.**(A).**Since this expression is com plicated,deal w ith the denom inator first.To add 5 to the fraction,m ake a com m on denom inator (*y* - 2*x*):

$$\frac{3y}{y-2x}+5=\frac{3y}{y-2x}+5\frac{y-2x}{y-2x}=\frac{3y}{y-2x}+\frac{5(y-2x)}{y-2x}$$
$$=\frac{3y}{y-2x}+\frac{5y-10x}{y-2x}=\frac{8y-10x}{y-2x}$$

N ow put $\frac{8y-10x}{y-2x}$ back into the original expression.Y ou can flip and m ultiply:

$$\frac{\frac{5x-4y}{2x-y}}{\frac{3y}{y-2x}+5}=\frac{\frac{5x-4y}{2x-y}}{\frac{8y-10x}{y-2x}}=\left(\frac{5x-4y}{2x-y}\right)\left(\frac{y-2x}{8y-10x}\right)$$

B y looking at the answ er choices,you can tell that this expression m ust be reducible to a num ber.H ow ? Look at *y* - 2*x* and 2*x* - *y*.They are actually negatives of each other: 2*x* - *y* = -(*y* - 2*x*).So you can then cancel the w hole expression *y* - 2*x* from top and bottom :

$$\left(\frac{5x-4y}{2x-y}\right)\left(\frac{y-2x}{8y-10x}\right)=\left(\frac{5x-4y}{-(y-2x)}\right)\left(\frac{y-2x}{8y-10x}\right)=\left(\frac{5x-4y}{-1}\right)\left(\frac{1}{8y-10x}\right)$$

You can do the same thing with the remaining terms: $8y - 10x = -2(5x - 4y)$.

$$\left(\frac{5x-4y}{-1}\right)\left(\frac{1}{8y-10x}\right)=\left(\frac{5x-4y}{-1}\right)\left(\frac{1}{-2(5x-4y)}\right)=\left(\frac{1}{-1}\right)\left(\frac{1}{-2}\right)=\frac{1}{2}$$

50. **(E).** To divide fractions, multiply by the reciprocal.

$$\frac{39^2}{2^4}\div\frac{13^3}{4^2}=\frac{39^2}{2^4}\times\frac{4^2}{13^3}$$

Now break down to primes and cancel common factors.

$$\frac{39^2}{2^4}\times\frac{4^2}{13^3}=\frac{(3\times13)^2\times(2^2)^2}{2^4\times13^3}=\frac{3^2\times13^2\times2^4}{2^4\times13^3}=\frac{3^2}{13}=\frac{9}{13}$$

51. **(E).** You can take the fourth root by taking the square root *twice*. So you should expect the fourth root of an integer greater than 1 to be much smaller than the number itself (for instance, the fourth root of 16 is 2, and the fourth root of 625 is 5).

One way to approach this problem is this: what integer *n* would give you *exactly* 3 as its fourth root?

$$\sqrt[4]{n}=3$$

Raise each side to the fourth power:

$$n = 3^4 = 81$$

Only the interval in choice (E) contains 81.

Alternatively, take the fourth root (by using the square root button twice) of the values in the answer choices. The fourth root of 40 is 2.5148… which rounds to 3. Likewise, if you take the fourth root of 150, you get 3.4996… which also rounds to 3.